

# 5R4GYB

## Full-Wave Vacuum Rectifier

For Industrial & Military Applications

### GENERAL DATA

#### Electrical:

Filament, Coated:<sup>a</sup>

Voltage (AC or DC). . . . . 5 volts

Current . . . . . 2 amp

#### Mechanical:

Operating Position. . . . . Vertical, base down or up, or  
Horizontal with pins 2 and 4 in vertical plane

Maximum Overall Length. . . . . 4-1/4"

Maximum Seated Length. . . . . 3-11/16"

Diameter. . . . . 1.438" to 1.562"

Bulb. . . . . T12

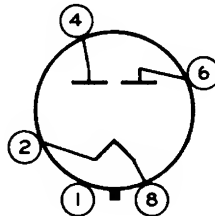
Base. . . . . Short Medium-Shell Octal 5-Pin Micanol

with External Barriers, Style B, Arrangement 1

(JEDEC Group 1, No.B5-121)

Basing Designation for BOTTOM VIEW. . . . . 5T

Pin 1 - No Connection  
Pin 2 - Filament



Pin 4 - Plate No.2  
Pin 6 - Plate No.1  
Pin 8 - Filament

### FULL-WAVE RECTIFIER

#### Maximum Ratings, Absolute-Maximum Values:

| <i>For altitudes up to</i>                                    | <i>40000</i>              | <i>20000</i> | <i>feet</i> |
|---------------------------------------------------------------|---------------------------|--------------|-------------|
| PEAK INVERSE PLATE VOLTAGE. . .                               | 2650 max.                 | 3100 max.    | volts       |
| AC PLATE SUPPLY VOLTAGE PER<br>PLATE (RMS, without load) . .  | See <i>Rating Chart I</i> |              |             |
| PEAK PLATE CURRENT PER PLATE. .                               | 715 max.                  | 715 max.     | ma          |
| DC OUTPUT CURRENT PER PLATE . .                               | See <i>Rating Chart I</i> |              |             |
| HOT-SWITCHING TRANSIENT PLATE<br>CURRENT PER PLATE . . . . .  | <b>b</b>                  | <b>b</b>     |             |
| BULB TEMPERATURE (At hottest<br>point on bulb surface). . . . | 230 max.                  | 230 max.     | °C          |

#### Typical Operation:

With capacitor-input filter

|                                                                         | For altitudes up to | 40000 | 20000 | feet  |
|-------------------------------------------------------------------------|---------------------|-------|-------|-------|
| AC-Plate-to-Plate Supply Voltage (RMS, without load) .                  | 1400                | 1500  | 2000  | volts |
| Filter-Input Capacitor. . . . .                                         | 20                  | 20    | 20    | μf    |
| Total Effective Plate Supply Impedance Per Plate <sup>c</sup> . . . . . | 225                 | 250   | 375   | ohms  |



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DATA 1  
7-61

# 5R4GYB

DC Output Voltage (Approx.) at

Input to Filter:

At half-load ma. =

|               |     |     |      |       |
|---------------|-----|-----|------|-------|
| 75 . . . . .  | -   | 910 | 1210 | volts |
| 125 . . . . . | 750 | -   | -    | volts |

At full-load ma. =

|               |     |     |      |       |
|---------------|-----|-----|------|-------|
| 150 . . . . . | -   | 800 | 1040 | volts |
| 250 . . . . . | 605 | -   | -    | volts |

Voltage Regulation (Approx.):

Half-load to full-load

|                   |     |     |     |       |
|-------------------|-----|-----|-----|-------|
| current . . . . . | 145 | 110 | 170 | volts |
|-------------------|-----|-----|-----|-------|

|                             |     |     |     |    |
|-----------------------------|-----|-----|-----|----|
| DC Output Current . . . . . | 250 | 150 | 150 | ma |
|-----------------------------|-----|-----|-----|----|

*With choke-input filter*

|                            |              |              |             |
|----------------------------|--------------|--------------|-------------|
| <i>For altitudes up to</i> | <i>40000</i> | <i>20000</i> | <i>feet</i> |
|----------------------------|--------------|--------------|-------------|

AC Plate-to-Plate Supply

|                                       |      |      |       |
|---------------------------------------|------|------|-------|
| Voltage (RMS, without load) . . . . . | 1500 | 1900 | volts |
|---------------------------------------|------|------|-------|

|                              |   |    |        |
|------------------------------|---|----|--------|
| Filter-Input Choke . . . . . | 5 | 10 | henrys |
|------------------------------|---|----|--------|

DC Output Voltage (Approx.) at

Input to Filter for dc out-

put ma. =

|                |     |     |       |
|----------------|-----|-----|-------|
| 87.5 . . . . . | -   | 800 | volts |
| 125 . . . . .  | 600 | -   | volts |

|               |     |     |       |
|---------------|-----|-----|-------|
| 175 . . . . . | -   | 760 | volts |
| 250 . . . . . | 560 | -   | volts |

Voltage Regulation (Approx.):

Half-load to full-load

|                   |    |    |       |
|-------------------|----|----|-------|
| current . . . . . | 40 | 40 | volts |
|-------------------|----|----|-------|

|                             |     |     |    |
|-----------------------------|-----|-----|----|
| DC Output Current . . . . . | 250 | 175 | ma |
|-----------------------------|-----|-----|----|

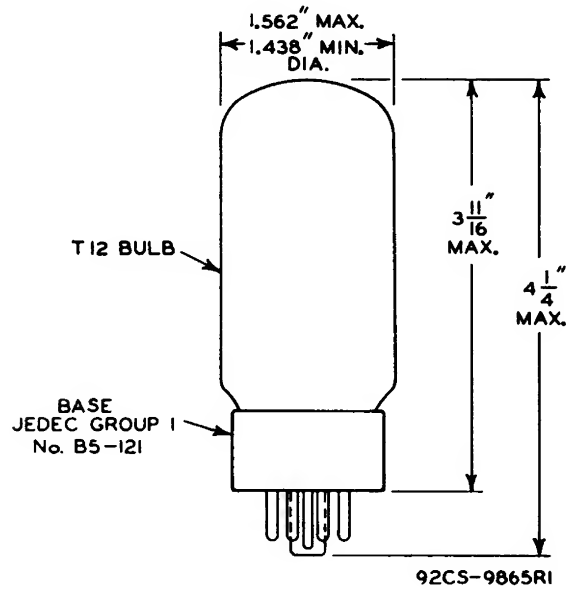
<sup>a</sup> See accompanying chart *Operating Areas for Simultaneous and Delayed Application of Plate Voltage* for conditions necessitating delay in application of plate voltage until filament has reached operating temperature.

<sup>b</sup> If hot-switching is required in operation, choke-input circuits are recommended. Such circuits limit the hot-switching current to a value no higher than that of the peak plate current. When capacitor-input circuits are used, a maximum value of 3 amperes should not be exceeded.

<sup>c</sup> Indicated values for conditions shown will limit peak plate current to the maximum-rated value. When a filter-input capacitor larger than 20  $\mu$ f is used, it may be necessary to increase plate-supply impedance to a higher value than that shown in the data to limit the peak plate current to the maximum-rated value.



# 5R4GYB

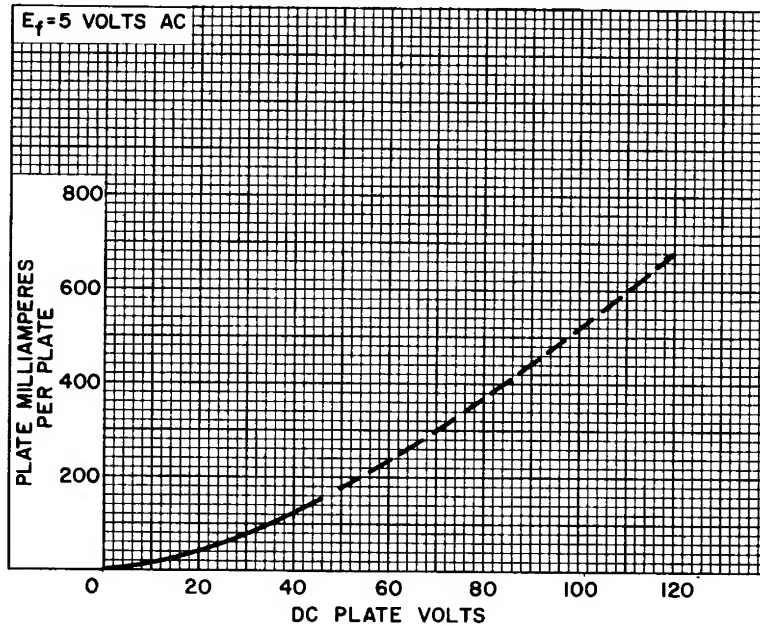


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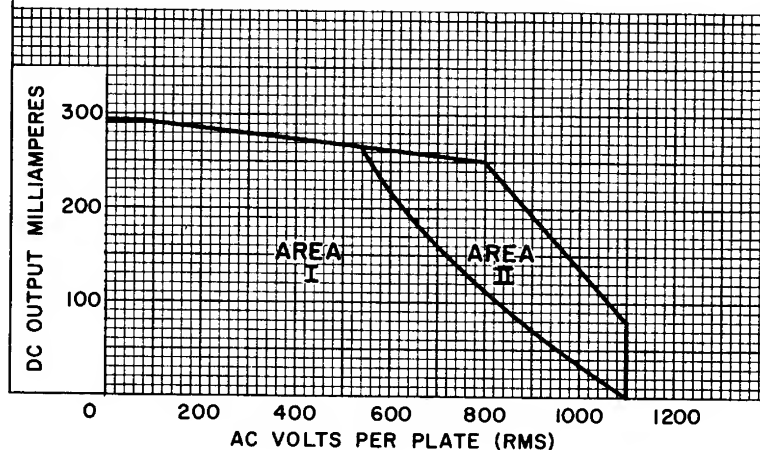
## AVERAGE PLATE CHARACTERISTIC



92CS-11183

## OPERATING AREAS FOR SIMULTANEOUS AND DELAYED APPLICATION OF PLATE VOLTAGE

FULL-WAVE RECTIFIER SERVICE WITH CAPACITOR-INPUT FILTER.  
AREA I—FILAMENT AND PLATE VOLTAGE MAY BE APPLIED SIMULTANEOUSLY.  
AREA II—FILAMENT SHOULD BE ALLOWED TO REACH OPERATING TEMPERATURE BEFORE PLATE VOLTAGE IS APPLIED. FOR AVERAGE CONDITIONS, THE DELAY IS APPROXIMATELY 10 SECONDS.

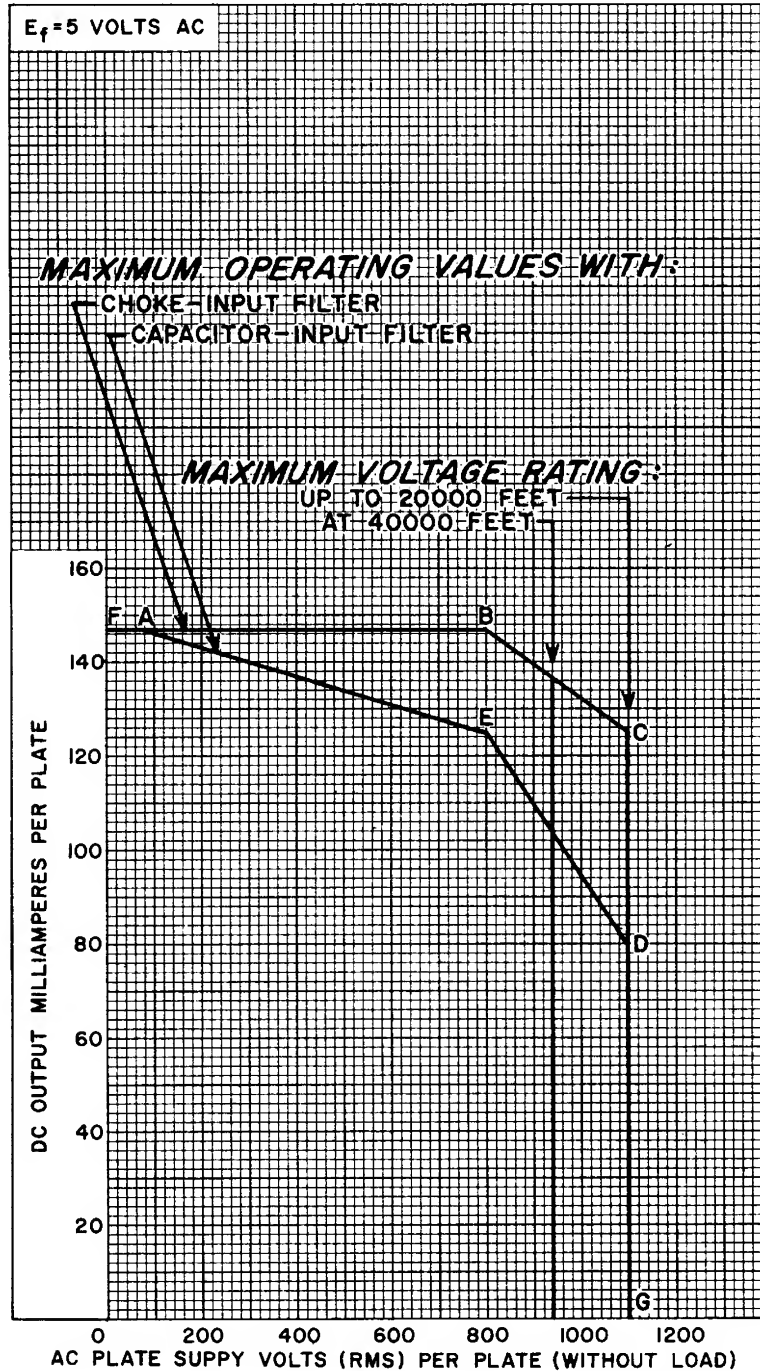


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## RATING CHART I



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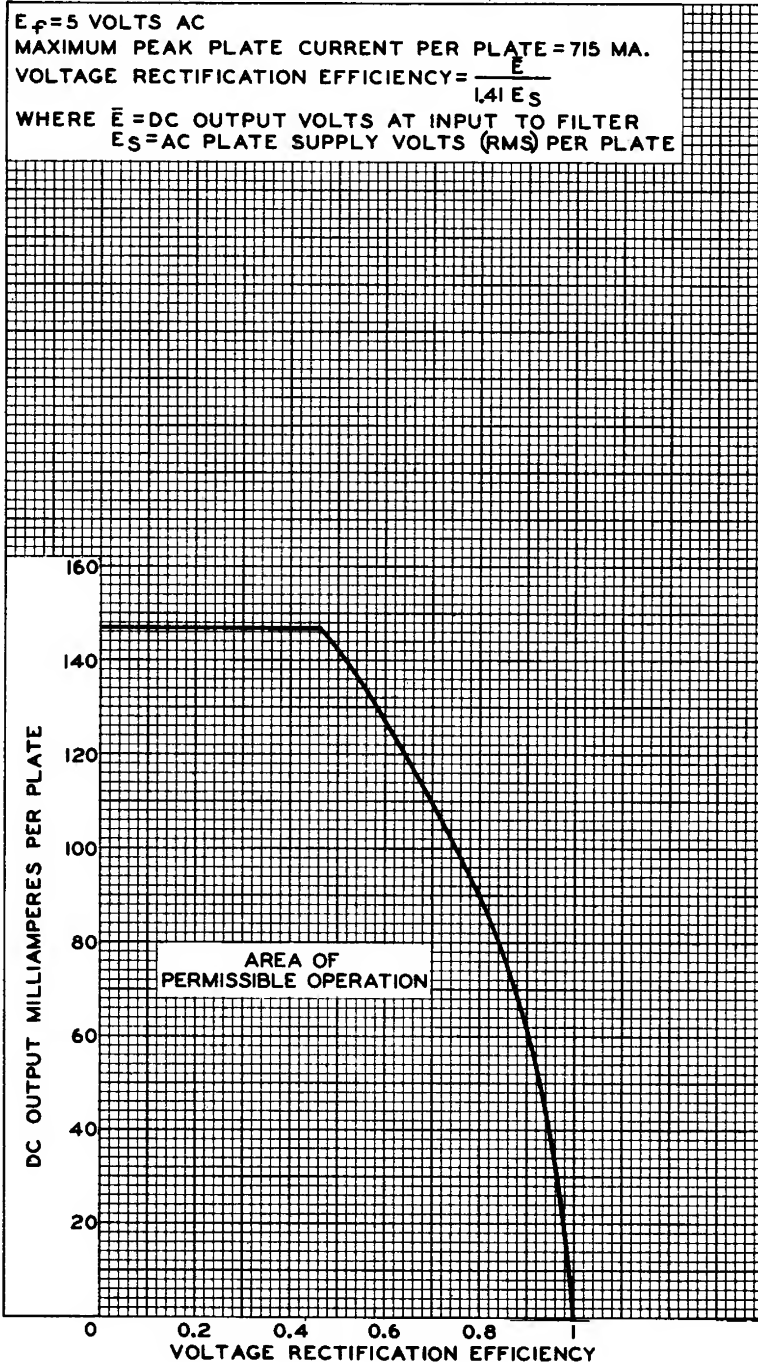


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## RATING CHART II With Capacitor-Input Filter



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## RATING CHART III With Capacitor-Input Filter

$E_f = 5$  VOLTS AC

MAXIMUM HOT-SWITCHING AMPERES = 3

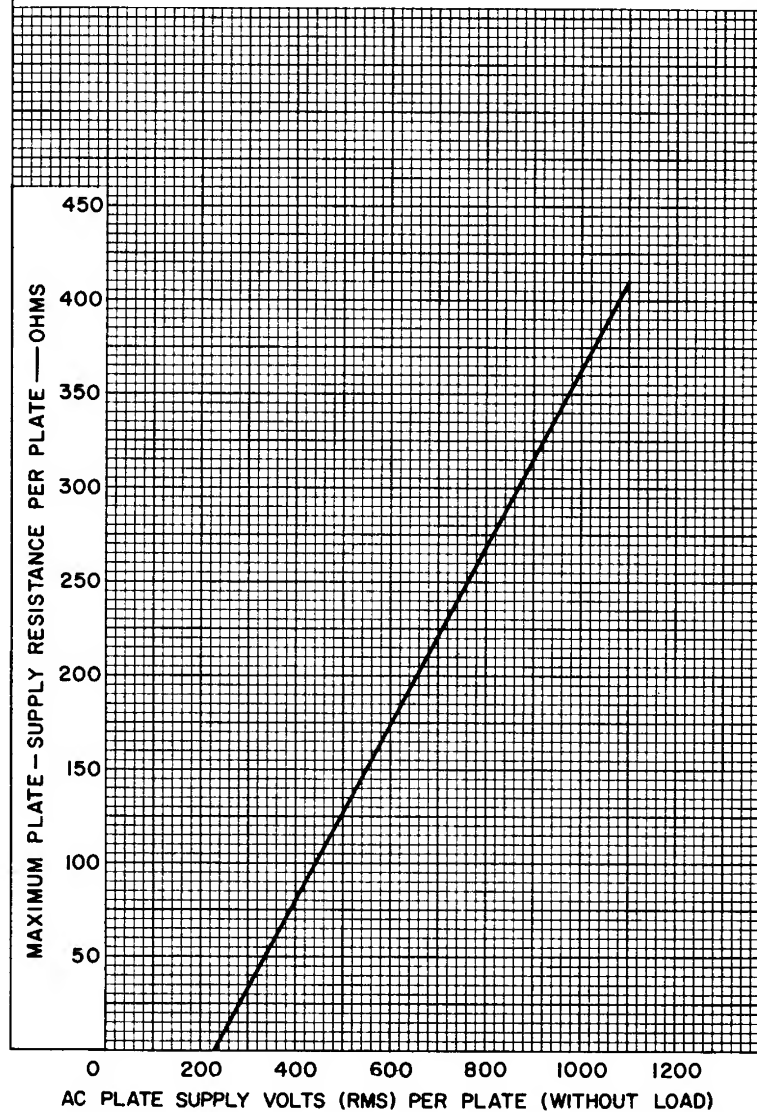
PLATE-SUPPLY RESISTANCE PER PLATE =  $R_{SEC.} + N^2 R_{PRI.} + R_A$

WHERE  $R_{SEC.}$  = DC RESISTANCE OF TRANSFORMER  
SECONDARY PER SECTION

$R_{PRI.}$  = DC RESISTANCE OF TRANSFORMER PRIMARY

$R_A$  = DC RESISTANCE OF ADDED SERIES RESIS-  
TANCE PER PLATE

$N$  = TRANSFORMER-VOLTAGE STEP-UP RATIO  
PER SECTION



92CM-6416R4



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DATA 4  
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